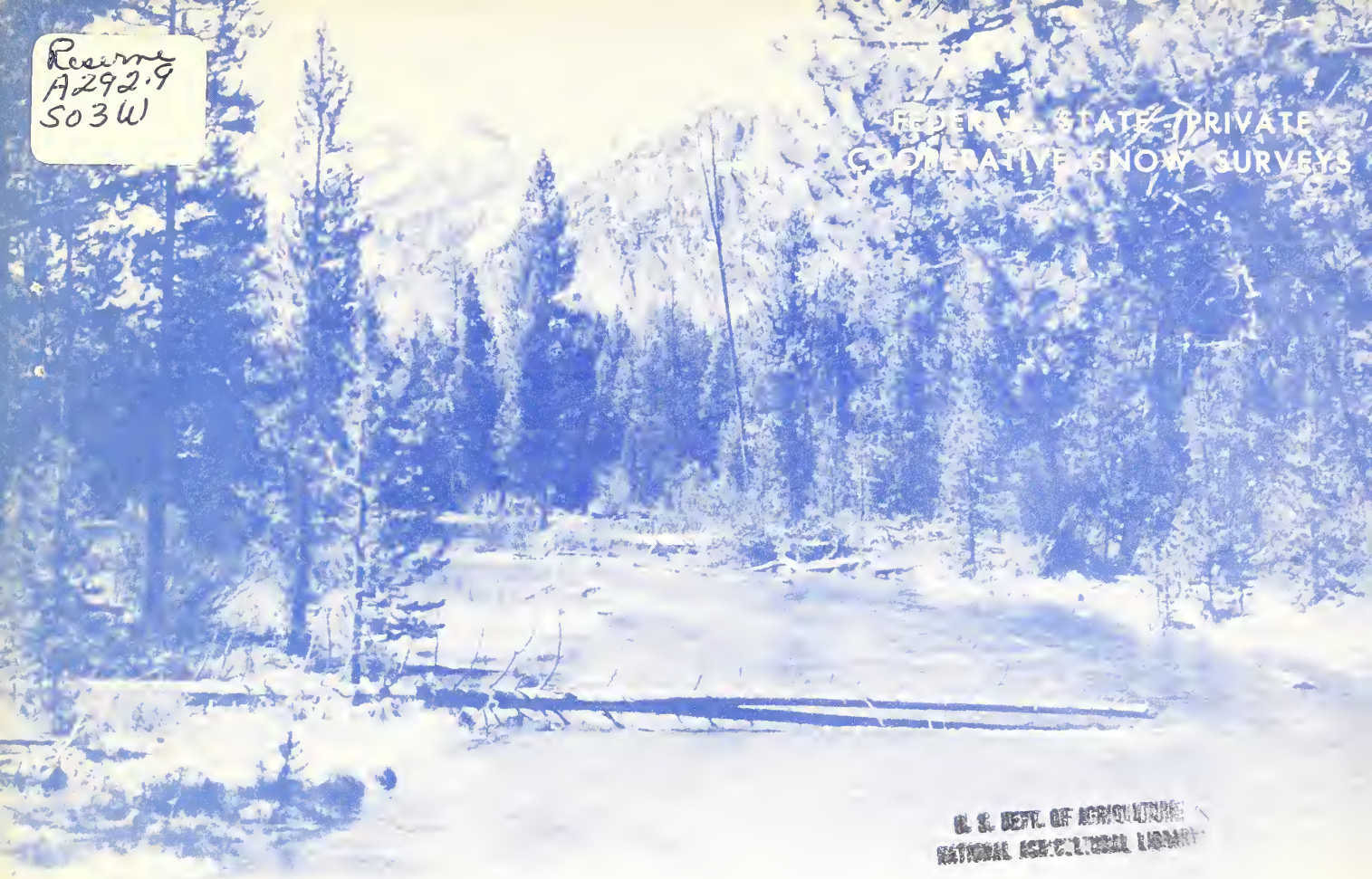


WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WESTERN UNITED STATES
Including Columbia River Drainage in Canada

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE
Collaborating with
CALIFORNIA DEPARTMENT of WATER RESOURCES
and
BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES

AS OF
MAY 1, 1966

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN. 15 - APR. 1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

USDA-SCS-PORTLAND OREG 1965

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WESTERN UNITED STATES
Including Columbia River Drainage in Canada

ISSUED

MAY 1, 1966

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

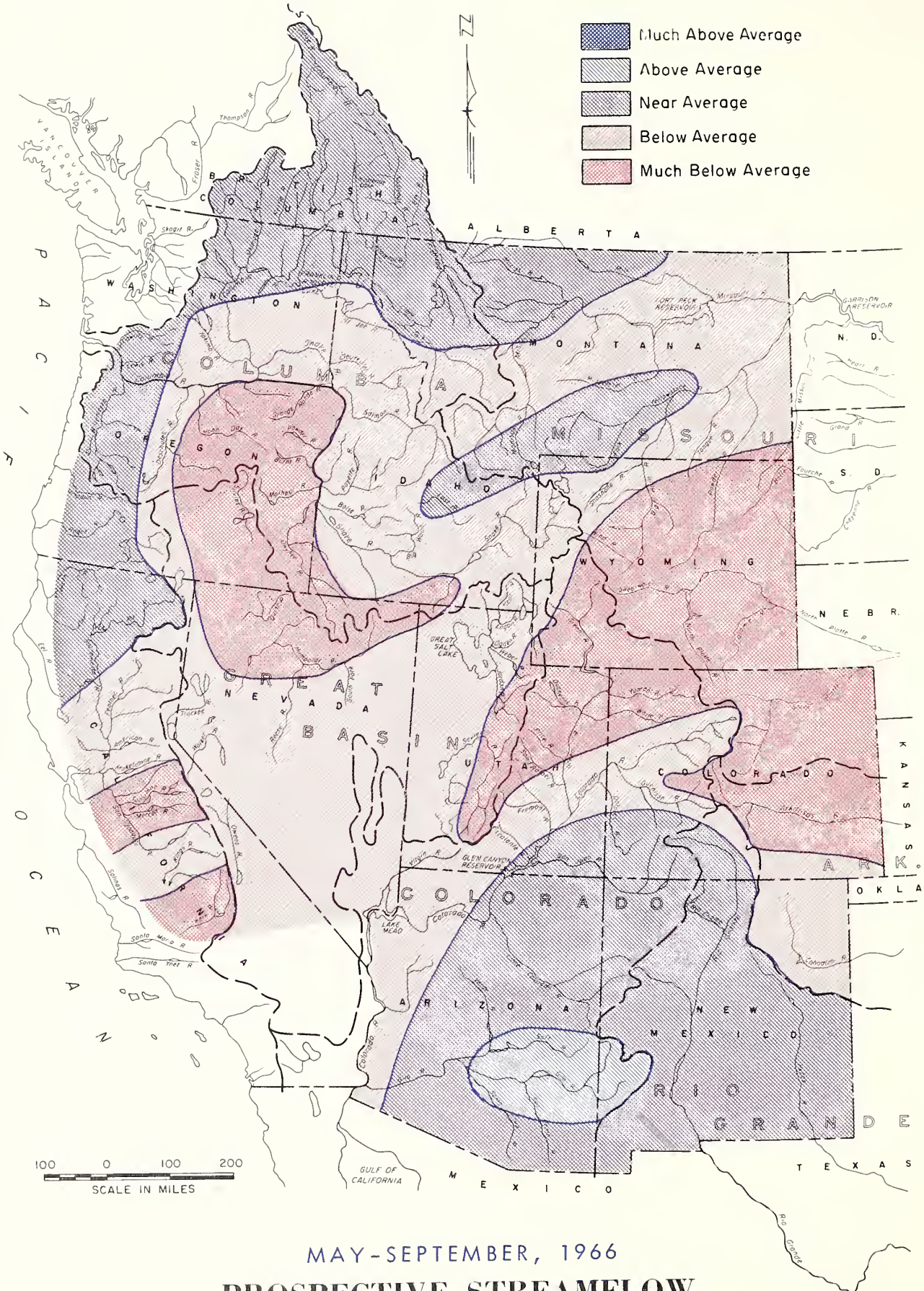
The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Branch, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Surveys Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D. A. WILLIAMS, ADMINISTRATOR



MAY-SEPTEMBER, 1966

PROSPECTIVE STREAMFLOW

AS OF MAY 1, 1966

WATER SUPPLY OUTLOOK

As of May 1, 1966

FORECASTS OF STREAMFLOW ARE BELOW AVERAGE FOR ALL WESTERN STREAMS FOR 1966. MOST SEVERE SHORTAGES ARE ANTICIPATED FOR THE COLORADO RIVER BASIN ABOVE LAKE POWELL AND ADJACENT WATERSHEDS IN COLORADO, WYOMING AND UTAH. CARRYOVER STORAGE WILL ALLEVIATE SEVERE WATER SHORTAGES IN MAJOR IRRIGATED AREAS.

Carryover storage from the high runoff year of 1965 will make the difference between generally adequate water supplies for 1966 and widespread shortage for irrigation. Streamflow will be near a minimum of record over most of the Colorado River Basin and adjacent areas in Colorado, Wyoming and Utah. In many of these areas, demands often exceed the average water supply. Demands on stored water have been relatively high early in the season because of the general below average valley rainfall since February. March precipitation was particularly deficient. Streamflow forecasts have been lowered substantially since midwinter in all areas except the upper Columbia and adjacent watershed of western Oregon and Washington and northern California and the extreme upper Missouri River watersheds. An exception to the general low flow outlook is central Arizona where winter streamflow has been high; reservoir storage is the highest in 25 years and flows continue above average.

Weather has continued mild and warm in early May which will continue to reduce streamflow prospects to a slight degree. Early and relatively low peak flows in relation to total runoff can be expected. April runoff has been near or below average even with above average temperature sequences.

Irrigated areas along the main streams will have adequate water supplies at the expense of substantial depletions in reservoir storage.

If snowfall next winter is below average, water conditions for 1967 could be critical without the cushion of carryover storage.

The California Department of Water Resources reports that below normal streamflow is expected for most streams in the State during the coming summer months. Although the northern portion of the State and areas served from conservation facilities will have adequate supplies for normal operation, many areas will have to supplement surface supplies from ground water basins. Reservoir storage remains near or above normal in all areas due to excellent carryover supplies and relatively heavy inflow from the dwindling snowpack.

SNOWPACK

Snowpack in late season continued with the same pattern as mid-winter. Remaining snowpack is near average in the upper Columbia River and its tributaries in Montana and British Columbia and from the Cascade range of Oregon and Washington. An isolated area of near average snowpack remains along the Continental Divide headwaters of the Rio Grande and San Juan in southwestern Colorado. Near three-quarters of average snowpack was measured on upper Missouri tributaries and the main Yellowstone and the headwaters of the Snake River near Yellowstone Park. Elsewhere, snow is limited to the higher elevations, and is generally 30 to 60 percent of average for May 1.

STORAGE

Storage in irrigation, municipal and multipurpose reservoirs remains generally above average representing a substantial improvement over a year ago. Power reservoirs tend to be below average in all major basins, the Missouri, Columbia and Colorado. Storage in west coast states of Washington and California is slightly below average as of May 1, as a result of low flow during April and heavy early season demands. Carryover storage is especially high in respect to average in Arizona, Colorado, Idaho and Nevada.

On the Missouri River main stem, storage tends to be above average for this date. While total storage in Lake Mead is below the average, this is due largely to storage in upstream reservoirs during the 1965 runoff period. In total, for the Colorado Basin there has been a substantial increase since a year ago. With anticipated flows near a minimum of record, increases in storage are not likely this year. With deficient winter flows, reservoirs on the Columbia have been lowered to meet power demands and there has been little re-filling to date.

STREAMFLOW FORECASTS

There has been a substantial decline in streamflow forecasts since February 1 with the greatest decline during March. The upper Columbia Basin and northwest coastal streams

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS

MAY 1, 1966

MAJOR BASIN AND SUB — WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
MISSOURI BASIN		
Jefferson	46	68
Madison	33	61
Gallatin	60	85
Missouri Main Stem	61	89
Yellowstone	55	78
Shoshone	50	63
Wind	57	76
North Platte	45	67
South Platte	33	46
ARKANSAS BASIN		
Arkansas	36	52
Canadian	--	--
RIO GRANDE BASIN		
Rio Grande (Colo.)	52	97
Rio Grande abv. Otowi Bridge	45	90
Pecos	--	--
COLORADO BASIN		
Green (Wyo.)	52	72
Yampa - White	34	45
Duchesne	44	67
Price	25	42
Upper Colorado	40	55
Gunnison	44	56
San Juan	48	76
Dolores	49	71
Virgin	11	30
Gila	--	--
Salt	--	--
GREAT BASIN		
Bear	35	48
Logan	29	39
Ogden	28	36
Weber	29	39
Provo - Utah Lake	20	27
Jordan	18	21
Sevier	17	25
Walker - Carson	34	54
Tahoe - Truckee	18	26
Humboldt	--	--
Lake Co. (Oregon)	--	--
Harney Basin (Oregon)	--	--
UPPER COLUMBIA BASIN		
Columbia (Canada)	110	105
Kootenai	76	75
Clark Fork	61	74
Bitterroot	51	63
Flathead	69	77
Spokane	78	78
Okanogan	84	77
Methow	70	63
Chelan	83	72
Wenatchee	76	64

MAJOR BASIN AND SUB — WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
SNAKE BASIN		
Snake above Jackson, Wyo.	65	88
Snake above Hiese, Idaho	50	87
Snake abv. American Falls Res.	54	85
Henry's Fork	39	85
Southern Idaho Tributaries	44	52
Big and Little Wood	36	70
Boise	46	63
Owyhee	45	46
Payette	55	71
Malheur	37	41
Weiser	55	68
Burnt	34	47
Powder	45	58
Salmon	49	69
Grande Ronde	38	50
Clearwater	74	74
LOWER COLUMBIA BASIN		
Yakima	90	69
Umatilla	64	38
John Day	38	48
Deschutes	96	78
Hood	161	92
Willamette	162	92
Lewis	164	116
Cowlitz	86	63
PACIFIC COASTAL BASIN		
Puget Sound	104	78
Olympic Peninsula	147	105
Umpqua - Rogue	102	75
Klamath	85	79
Trinity	215	130
CALIFORNIA CENTRAL VALLEY		
Upper Sacramento	110	115
Feather	75	80
Yuba	55	60
American	35	40
Mokelumne	30	35
Stanislaus	30	30
Tuolumne	25	35
Merced	35	45
San Joaquin	35	45
Kings	40	50
Kaweah	35	45
Tule	30	40
Kern	30	40

Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.

Average is for 1948-62 period. California averages are for the 1931-1960 period. *Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Repetitive Monthly Measurement Schedules.*

SELECTED STREAMFLOW FORECASTS MAY-SEPTEMBER as of MAY 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
GREAT BASIN	1965	1966	1966
Bear at Harer, Idaho	433	125	62
Logan near Logan, Utah 21/	166	70	60
Ogden, Inflow to Pine View Res., Utah 22/ (May-July)	100	48	67
Weber near Oakley, Utah	179	75	60
Inflow to Utah Lake, Utah	300	110	54
Big Cottonwood near Salt Lake City, Utah	44	22	63
Beaver near Beaver, Utah	26	11	49
South Fork Humboldt near Elko, Nevada (May-July)	81	38	78
Humboldt at Palisades, Nevada (May-July)	201	60	48
Truckee at Farad, California 25/ (May-July)	222	130	68
East Carson near Gardnerville, Nevada (May-July)	193	110	77
West Walker near Coleville, California (May-July)	168	100	79
UPPER COLUMBIA			
Columbia at Revelstoke, British Columbia	18580	20700	107
Kootenai at Wardner, British Columbia		4500	96
Kootenai at Leonia, Idaho	8094	8500	101
Flathead near Columbia Falls, Montana 26/	6586	5100	88
Flathead near Polson, Montana 26/	8067	6000	87
Clark Fork above Missoula, Montana	2150	1180	73
Bitterroot near Darby, Montana	647	385	74
Clark Fork at Whitehorse Rapids, Montana 26/	14845	10350	82
Columbia at Birchbank, British Columbia 26/	40280	41000	96
Spokane at Post Falls, Idaho 27/	1924	1700	75
Columbia at Grand Coulee, Washington 26/	61250	58900	93
Okanogan near Tonasket, Washington	1492	1440	80
Chelan at Chelan, Washington 28/		950	78
Wenatchee at Peshastin, Washington	1483	1410	83
SNAKE			
Snake above Palisades Res., Wyoming 29/		2000	77
Snake near Heise, Idaho 29/	4772	2700	77
Henry's Fork near Rexburg, Idaho 30/	1403	850	76
Big Lost near Mackay, Idaho 31/	330	140	98
Big Wood, Inflow to Magic Res., Idaho 32/ (Mar-July)	452	100	62
Bruneau near Hot Springs, Idaho	208	105	70
Owyhee Res., Net Inflow, Oregon	265	55	30
Boise near Boise, Idaho 33/	2138	900	72
Malheur near Drewsey, Oregon	57	13	37
Payette near Horseshoe Bend, Idaho 34/	2223	1200	76
Snake at Weiser, Idaho	6814	3200	60
Salmon at Whitebird, Idaho	9160	4000	77
Clearwater at Spalding, Idaho	7452	5800	80
LOWER COLUMBIA			
Grande Ronde at LaGrande, Oregon	113	65	50
Yakima at Cle Elum, Washington 35/		660	78
Deschutes at Benham Falls, Oregon 36/	----	426	79
Columbia at The Dalles, Oregon 26/	96300	82500	87
Hood near Hood River, Oregon 36/		242	87
Willamette at Salem, Oregon 36/ (Apr-Sept)		4925	88
Lewis at Ariel, Washington 37/	688	1050	105
Cowlitz at Castle Rock, Washington	1593	2100	94

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for 1911-1960.
Forecasts assume average Effective Climatic Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts Listed on Inside Back Cover.
** April - June Period ** April - July Period*

SELECTED STREAMFLOW FORECASTS MAY-SEPTEMBER 1966 as of MAY 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
	1965	1966	
NORTH PACIFIC COASTAL			
Dungeness near Sequim, Washington	110	150	95
Rogue at Raygold, Oregon	664	700	96
Klamath Lake, Net Inflow, Oregon	411	315	72
CALIFORNIA CENTRAL VALLEY 38/**			
Sacramento, Inflow to Shasta, California	2030	1540	86
Feather near Oroville, California	2262	1280	66
Yuba at Smartville, California	1287	750	67
American, Inflow to Folsom Res., Calif.	1519	820	59
Cosumnes at Michigan Bar, California	174	55	42
Mokelumne, Inflow to Pardee Res., Calif.	581	280	58
Stanislaus, Inflow to Melones Res., Calif.	880	410	56
Tuolumne, Inflow to Don Pedro Res., Calif.	1493	680	56
Merced, Inflow to Exchequ Res., Calif.	745	340	55
San Joaquin, Inflow to Millerton Lake, Calif.	1421	710	58
Kings, Inflow to Pine Flat Res., California	1300	740	63
Kaweah, Inflow to Terminus Res., California	314	110	42
Tule, Inflow to Success Res., California	64	13	23
Kern, Inflow to Isabella Res., California	456	200	46

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for 1911-1960.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.
** April - June Period ** April - July Period*

For the Gila and Salt River projects in Arizona the water supply is the most favorable in 25 years. Reservoirs on the Salt River are near capacity. San Carlos reservoir is at the highest level since 1943. Mountain snow has almost melted, except for the highest elevations, but streamflow remains above average for this date.

INTERIOR BASIN

Water supply outlook varies substantially among the relatively small streams of the interior basin. Snowfall since mid-winter has been much below average. With warm weather in March and April, snowfall has melted early. As a result, streamflow is forecast at well below average with near minimum flows in prospect for much of central Utah. Water supply prospects depend almost directly on carryover storage. Storage and direct flow will provide reasonable water supplies on Bear River tributaries and other streams north of Salt Lake City. Most severe shortages are in prospect for northern tributaries to the Sevier and small streams south and east of Salt Lake City. Major reservoirs have substantial water in storage.

In Nevada water supply prospects are fair to good on the Humboldt and its South Fork. Below Rye Patch Reservoir water will be adequate. Streams north of the Humboldt will have shortages. East slope of Sierra streams will flow less than average, but storage will make up the deficiency for the major irrigated areas. Areas that depend on direct diversion will have shortages rather early in the season.

COLUMBIA BASIN

The flow of the Columbia River at The Dalles, Oregon is forecast at about 90 percent of average for the snowmelt period. Since the heaviest snow cover on the watershed remaining on May 1 is in the extreme northern section of the watershed in British Columbia, relatively low peak flows are anticipated. Power reservoirs are also at lower than average levels for this date.

The flow of the Kootenai and Clark Fork tributaries is expected to be in the range of 90 percent of average with somewhat less on the upper Clark Fork tributaries.

For the Snake River and its major tributaries through southern Idaho streamflow will be substantially below average, but water supplies for irrigation will be adequate because of the high level of stored water carried over from 1965. Southern tributaries to the Snake can expect some shortages where no or inadequate

storage is available. The past two months have been dry which has resulted in heavy early season demands for irrigation water. April flows have been among the lower third of the years of record.

The outlook for water supplies in Oregon is poor in the eastern half of the state except for the large project areas where adequate storage is available or where water can be pumped. In the western half, for streams on both sides of the Cascades and coastal areas, water supplies will be satisfactory. Streamflow forecasts have been gradually reduced through the snow accumulation season. Reservoir storage remains slightly above average for May 1.

In Washington, water supply outlook has been reduced substantially during the past two months. April was warm and dry. The snowpack depletion was greater than usual without corresponding runoff. In general, precipitation was generally just a trace except for the highest elevations.

With the decline in streamflow prospects, lack of valley precipitation, and early demands for water, Yakima reservoirs may not fill this year. In the Okanogan area, reservoirs which have been lowered for repairs are not expected to fill during the snowmelt period.

The Water Resources Service of the Province of British Columbia reports that May 1 snow survey measurements indicate a near average snowmelt season runoff on Columbia, Kootenay and Frazer watersheds and below average flows for the Okanagan and Similkameen basins. Above average flows are in prospect for Vancouver Island and the lower coastal regions.

ALASKA

April climate was cool and dry through interior Alaska on the Yukon and its tributaries. As of May 1, snow cover at higher elevations is near or slightly below normal. Snow at lower and middle elevations is somewhat greater than average because normal April melting did not occur. Interior rivers will be generally late in breaking up in 1966.

Very heavy snowpack exists in southeast Alaska in the coastal range near Juneau.

CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that a dry season is ahead for California with water supplies during the coming summer months being deficient in many areas. In February and March of this year, conditions were generally normal or above, but with each passing month of subnormal precipitation, the water supply outlook has progressively diminished. One month ago, the forecasts of statewide runoff fell below normal for the first time this year. As of May 1, this forecast is still 85 percent of normal.

This year, the legendary April 1 showers were deficient throughout the State and were almost nonexistent from Tulare Lake in the San Joaquin Valley south. Thus the season of precipitation and snow accumulation in California is essentially over. While it is still possible for rather heavy general storms to materialize, such occurrence is improbable.

The northern portion of California and areas served by reservoir storage projects will have generally adequate supplies this season. As in all but exceptionally good years, shortages can be anticipated in those localized areas where development of conservation storage and ground water basins have not kept pace with growth. This year, water users in much of the San Joaquin Valley will continue near normal operations, supplementing surface supplies by pumping from ground water basins. This supplementary supply, which plays such an important role in the State's economy, is relatively good with ground water levels throughout the State generally higher than in the spring of 1965.

In Southern California, local supplies still reflect the benefits from the heavy November precipitation and are more plentiful than in recent years. Local reservoir storage is generally above normal and most ground water levels are above those of one year ago. Although local conditions are more favorable than they have been for many years, imported supplies continue to be a necessity.

Precipitation in California during the past month was 40 percent of normal, with the northern half of the State averaging about 60 percent and the southern half 20 percent of the April normal. Precipitation in Sierra watersheds of the Central Valley--generally reflecting the statewide pattern--varied from highs of 75 percent of normal in the north, to a low of 5 percent of normal in the south.

May 1 snow surveys of key courses indicate that the water content in the State's snowpack is only 60 percent of average for this date. Usually, the April snowmelt reduces the pack by about 25 to 30 percent of the April 1 amount. With the prevailing conditions of the past month -- below average precipitation, combined with clear, sunny days and above normal temperatures -- the depletion of the pack ranged from 35 to 50 percent of the April 1 amount. Although April temperatures in many areas exceeded those of record, the melting of the snowpack was steady rather than spectacular.

STORAGE IN LARGE RESERVOIRS MAY 1, 1966

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER MISSOURI		
Boysen	700	330
Buffalo Bill	373	238
Canyon Ferry	2043	1478
Hebgen	377	267
Tiber	1316	708
Belle Fourche	185	157
Keyhole	331	131
Fort Peck	19410	16700
Fort Randall	4700	2950
Garrison	19400	13643
Oahe	18100	10885
PLATTE		
Glendo	786	458
Pathfinder	1015	466
Seminoe	1011	407
City of Denver (5)	588	475
Colo-Big Thompson (4)	865	510
ARKANSAS		
Conchas	280	239
John Martin	367	353
RIO GRANDE		
Elephant Butte	2207	480
El Vado	367	13
UPPER COLORADO		
Flaming Gorge	3789	2468
Navajo	1709	255
Powell	28040	9062
Blue Mesa	941	192
LOWER COLORADO		
Havusu	619	590
Mead	27209	15492
Mohave	1709	1708
San Carlos	1206	500
Salt River Res. (4)	1755	1720
Verde River Res. (2)	323	292
GREAT BASIN		
Bear	1421	1239
Lahontan	286	222
Rye Patch	179	163
Sevier Bridge	236	107
Strawberry	270	133
Tahoe	732	570
Utah	1149	772

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER COLUMBIA		
Chelan	676	283
Coeur d'Alene	238	173
Flathead	1791	818
Hungry Horse	2982	2437
Kootenay	673	487
Pend Oreille	1155	955
Roosevelt	5232	2786
LOWER COLUMBIA		
Cougar	155	120
Detroit	300	237
Hills Creek	200	171
Lookout Point	337	227
Yakima Res. (5)	1066	716
SNAKE		
American Falls	1700	1519
Arrowrock	287	259
Anderson Ranch	423	399
Brownlee	980	588
Cascade	653	496
Jackson	847	674
Lucky Peak	278	232
Palisades	1202	1142
Owyhee	715	634
PACIFIC COASTAL		
Cachuma	205	189
Casitas	254	85
Clair Engle	2500	2432
Clear Lake	440	243
Nacimiento	350	201
Ross	1203	571
Upper Klamath	584	501
CALIFORNIA CENTRAL VALLEY		
Almanor	1036	728
Berryessa	1602	1591
Camanche	432	131
Don Pedro	290	155
Folsom	1010	807
Hetch-Hetchy	360	255
Isabella	570	176
McClure	281	300
Millerton	521	398
Pine Flat	1013	608
Shasta	4500	4460

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

have not been materially affected by this trend. Most severely affected has been the upper Colorado River Basin where forecasts of near average flow on February 1 have been reduced to near 50 percent of average for the snowmelt season, near the minimum of record. Forecasts of streams east of the Continental Divide, including Wind River tributaries and the North Platte in Wyoming and the South Platte and Arkansas in Colorado are for near minimum flows as well. In Central Utah streamflow forecasts declined to near minimum flows on many central Utah drainages. In these latter areas, stored water may not be adequate to make up for all streamflow deficiency if the summer is dry.

Winter flows have been generally above average except for the Columbia Basin and the Central Valley of California.

MISSOURI BASIN

In general, water supply prospects remain good for the upper Missouri and its tributaries in Montana. Low elevation snow has melted, but higher elevation snowpack tended to increase during April. Streamflow forecasts are mostly in the range of 80 to 90 percent of average. Of course, flows will be much less than in the heavy runoff years of 1964 and 1965. Some late season water shortage may occur on smaller tributaries to the upper Missouri, the Clark Fork of the Yellowstone and along the Bitterroot.

For the upper Wind River above Boysen Dam, streamflow forecasts range near one-half of average. Areas not served by storage have water shortages in prospect, particularly in late season. Smaller tributaries to the Bighorn in Powell Basin may experience similar shortages. The flow of the Shoshone will be much less than average but stored water should provide adequate supplies.

The flow of the North Platte into Seminoe Reservoir is also forecast at about one-half of average, so late season shortage can be expected for the higher elevation valleys. Below the reservoirs, irrigation water supply will be adequate.

With one of the near minimum of record snowmelt season flow years in prospect on the South Platte and its tributaries, stored water and supplemental supplies may be strained to meet demands if the summer precipitation is low. Irrigated lands with junior rights should plan carefully as to water sources.

Storage in Denver Municipal reservoirs is especially favorable with recent increases in storage and a heavy runoff in 1965.

ARKANSAS BASIN

Forecasts of flow on the Arkansas are near a minimum of record. Storage in the valley is favorable, but much of the above average storage is in John Martin Reservoir downstream. Water supply will not be plentiful, but more adequate than in many recent years. Careful management will be required, particularly if the summer months are dry. Less than average flow is expected from southern tributaries. Local shortages on these streams may be expected.

Snowmelt season flow for the Canadian will be much less than average, but storage will provide an adequate water supply for project areas in New Mexico.

RIO GRANDE BASIN

The headwaters of the Rio Grande had above average snowfall in midwinter, and late season snowpack remains near average at higher elevations along the Continental Divide. Storage and streamflow should provide an adequate water supply for west-side streams. There will be some deficiency on eastern San Luis Valley tributaries.

Inflow to the Middle Rio Grande District of New Mexico is expected to be near average and about three-quarters of that for 1965. Storage for the lower valley in New Mexico and west Texas is slightly above average, but only one-quarter of capacity. Water supply will not be plentiful but better than many recent years.

On the Pecos, streamflow from snowmelt will be near average, but storage in Alamogordo Reservoir is down from average and a year ago.

COLORADO BASIN

Lack of snowfall during March along with losses from existing snowpack decreased streamflow prospects radically over the entire upper Colorado River Basin. This downward trend continued during April. Forecasts of tributary streams, except for the San Juan and Dolores, range near 50 to 60 percent of average. The San Juan and Dolores will have flows near 90 percent of average.

Considerable water shortage is in prospect for the smaller tributary streams in the upper basin in both Colorado and Utah. Along the major streams which have storage water supplies will be adequate.

Because of the relatively higher use upstream along with maximum trans-mountain diversions, inflow to Lake Powell is expected to be one-half of average for the remainder of the snowmelt season and roughly one-third of the inflow for 1965.

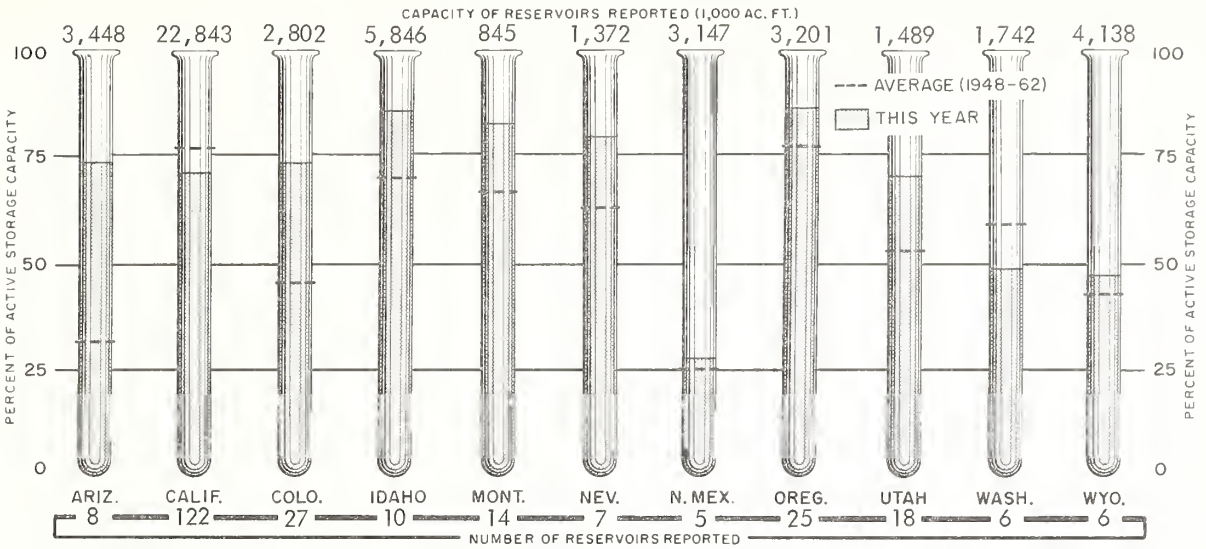
SELECTED STREAMFLOW FORECASTS MAY-SEPTEMBER 1966 as of MAY 1, 1966

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW	FORECAST	
UPPER MISSOURI	1965	1966	1966
Jefferson at Sappington, Montana	1516	632	77
Madison near Grayling, Montana 1/	520	335	92
Gallatin near Gateway, Montana	620	340	81
Missouri near Zortman, Montana 2/	6060	2900	75
Sun at Gibson Dam, Montana 3/	676	505	88
Marias near Shelby, Montana 4/	629	480	85
Milk near Eastern Crossing, Montana	231	185	90
Yellowstone at Livingston, Montana	2865	1810	90
Shields at Clyde Park, Montana	132	740	90
Clark Fork at Chance, Montana	736	480	86
Shoshone, Inflow to Buffalo Bill Res., Wyo.		520	64
Wind at Dubois, Wyoming		56	56
Bull Lake near Lenore, Wyoming		110	62
Tensleep near Tensleep, Wyoming		36	50
Yellowstone at Miles City, Montana 5/	8308	1810	90
Missouri near Williston, N. Dakota 6/	16400	6230	67
PLATTE			
North Platte at Saratoga, Wyoming		335	52
Laramie near Jelm, Wyoming 7/		59	53
Clear at Golden, Colorado	196c	77	57
St. Vrain at Lyons, Colorado	107	32	40
Cache LaPoudre near Fort Collins, Colorado 8/	272c	120	49
ARKANSAS			
Arkansas at Salida, Colorado 9/	549c	160	46
Purgatoire at Trinidad, Colorado	51	28	61
RIO GRANDE			
Rio Grande near Del Norte, Colorado 10/	769c	460	93
Conejos near Mogote, Colorado 11/	262c	175	89
Rio Chama near LaPuente, New Mexico	166	180	94
Rio Grande at Otowi Bridge, New Mexico 12/(May-July)	709c	620	101
Pecos at Pecos, New Mexico *	73	60	113
UPPER COLORADO			
Colorado near Granby, Colorado 13/		140	60
Colorado near Glenwood Springs, Colorado 14/	1247c	800	51
Roaring Fork at Glenwood Springs, Colorado 15/	978c	500	65
Gunnison at Grand Junction, Colorado	2053c	650	50
Dolores at Dolores, Colorado	333	206	80
Colorado near Cisco, Utah	4855	1490	45
Green below Flaming Gorge Res., Utah 16/**	1251	695	62
Yampa at Steamboat Springs, Colorado	309	150	51
White at Meeker, Colorado	361	185	56
Duchesne near Tabiona, Utah 17/	173	54	52
Rock Creek near Mountain Home, Utah	159	61	62
Price near Scofield, Utah 18/	53	14	44
Green at Green River, Utah 16/	4595	1200	41
San Juan near Rosa, New Mexico	873	580	97
Animas at Durango, Colorado	657	420	92
San Juan near Bluff, Utah 19/	1782	805	84
Colorado, Inflow to Lake Powell, Arizona 20/**	11810	3750	49
LOWER COLORADO			
Gila near Solomon, Arizona	--	--	--
Salt at Intake, Arizona	--	--	--
Verde above Horseshoe Dam, Arizona	--	--	--

(c) Subject to correction for diversions and storage.

Forecasts in Wyoming, Colorado and New Mexico are for Apr-Sept. period.

RESERVOIR STORAGE as of MAY 1, 1966



Based on May 1 storage values for 122 reservoirs with a combined usable capacity of over 22,800,000 acre-feet, the aggregate storage in California reservoirs is 110 percent of normal for this date. This represents a net increase of 120,000 acre-feet of water in storage over last year at this time.

U.S. DEPARTMENT of AGRICULTURE
SOIL CONSERVATION SERVICE
CONSERVATION OF WATER BEGINS WITH THE SNOW SURVEY

EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Change in storage in Hebgen Lake. 2/ Change in storage in Canyon Ferry and Tiber reservoirs. 3/ Change in storage in Gibson Reservoir and measured diversions. 4/ Change in storage in Two Medicine, Four Horns and Lake Francis reservoirs. 5/ Change in storage in Boysen and Buffalo Bill reservoirs.

6/ Change in storage in Boysen, Buffalo Bill, Canyon Ferry, Tiber, and Fort Peck reservoirs. 7/ Plus diversions to Cache la Poudre. 8/ Minus diversions from North Platte, Laramie, and Colorado rivers plus measured diversions above station. 9/ Change in storage in Twin Lakes and Sugar Loaf reservoirs minus diversions from Colorado River.

10/ Change in storage in Rio Grande, Santa Maria, and Continental reservoirs. 11/ Change in storage in Platoro Reservoir. 12/ Change in storage in El Vado Reservoir. 13/ Change in storage in Granby Reservoir plus diversions to Cache la Poudre and through Adams Tunnel. 14/ Changes as indicated in (13) plus Moffatt Tunnel diversion. 15/ Plus diversions to Arkansas River.

16/ Change in storage in Flaming Gorge and Big Sandy reservoirs. 17/ Plus diversion through Duchesne Tunnel. 18/ Change in storage in Scofield Reservoir. 19/ Change in storage in Navajo Reservoir. 20/ (Lee's Ferry) Change in storage in Flaming Gorge, Navajo, Lake Powell, and Big Sandy reservoirs.

21/ Plus Utah Power and Light Company tailrace and Logan, Hyde Park, and Smithfield canals. 22/ (Inflow record computed by U. S. Bureau of Reclamation.) 23/ Plus diversion by Weber-Provo Canal and change in storage in Wanship Reservoir. 24/ Change in storage in Deer Creek Reservoir, minus diversions through Duchesne Tunnel and Weber-Provo Canal, plus diversion through Salt Lake City Aqueduct. 25/ Change of storage in Lake Tahoe and Boca Reservoir. (Forecast by Truckee Basin Committee)

26/ Change in storage in any of these reservoirs above the station: Kootenai Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee and Noxon; and pumpage at Roosevelt Lake. 27/ Changes in storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie canals. 28/ Change in storage in Lake Chelan. 29/ Changes in storage for Jackson Lake and Palisades Reservoir above stations. 30/ Change in storage in Henry's Lake, Island Park and Grassy Lake reservoirs and diversions between Ashton and Rexburg.

31/ Change in storage in Mackay Reservoir, and diversion in Sharp Ditch. 32/ (Combined flow Big Wood River nr. Bellevue and Camas Creek nr. Blaine.) 33/ Change in storage in Arrowrock, Anderson Ranch, and Lucky Peak. 34/ Change in storage in Cascade and Deadwood reservoirs. 35/ Change in storage in Keechelus, Kachess, and Cle Elum reservoirs plus diversion by Kittitas Canal. 36/ (Corrected to natural flow). 37/ Change in storage in Merwin, Yale, and Swift reservoirs. 38/ (Corrected for upstream impairments).

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